Black Bear
Management Report
of survey-inventory activities
1 July 1998–30 June 2001

Carole Healy, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation
December 2002

ADF&G

Please note that population and harvest data in this report are estimates and may be refined at a later date.

If this report is used in its entirety, please reference as: Alaska Department of Fish and Game. 2002. Black bear management report of survey-inventory activities 1 July 1998–30 June 2001. C. Healy, editor. Project 17.0. Juneau, Alaska.

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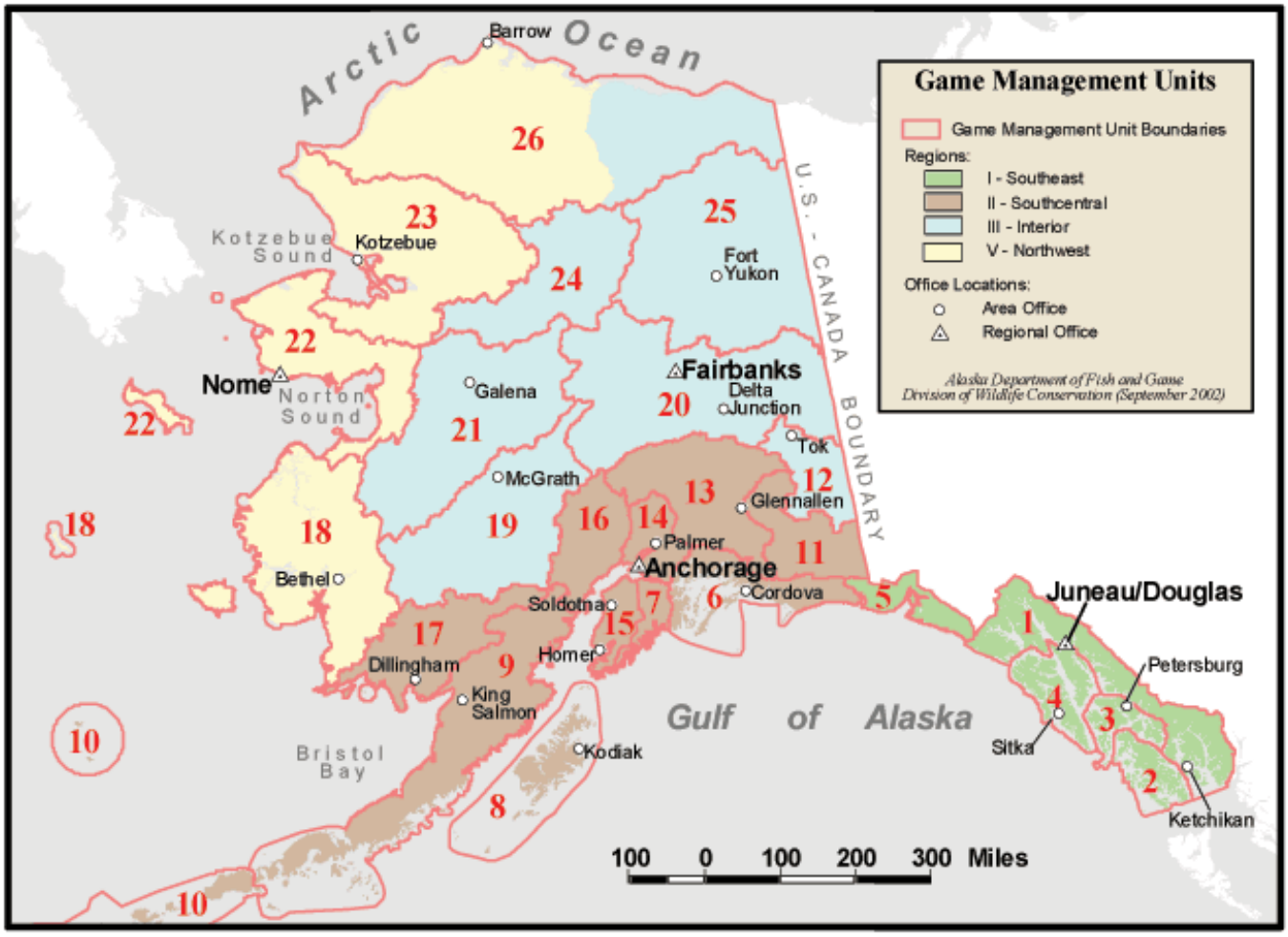
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BLACK BEAR MANAGEMENT REPORT

From: 1 July 1998
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 12 (9978 mi^2)

GEOGRAPHIC DESCRIPTION: Upper Tanana and White River drainages, including the northern Alaska Range east of the Robertson River, and the Mentasta, Nutzotin, and northern Wrangell Mountains

BACKGROUND

Historically, human use of black bears in Unit 12 was relatively low despite liberal hunting regulations and moderate bear population levels. Most black bear hunting occurred along the highway system and the Tanana River.

In 1992 interest in black bear hunting increased, particularly at bait stations, and has remained relatively high. Most bears are taken by local residents in the spring and are an important meat source. Even before regulations were implemented requiring the salvage of black bear meat from 1 January to 31 May, meat was salvaged from over 90% of all black bears harvested by local residents. In the fall most black bears were harvested incidentally during hunts for other species.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect, maintain, and enhance the black bear population and its habitat in concert with other components of the ecosystem.

- Provide the greatest sustained opportunity to participate in hunting black bears.

MANAGEMENT OBJECTIVE

- Manage for a harvest of black bears that maintains 55% or more males in the combined harvests during the most recent 3 years.

METHODS

Annual harvest information was collected from hunters during the mandatory sealing process of hunter-killed bears and bears killed in defense of life and property (DLP). These reports

provided data on harvest location and date, hunter residency and effort, sex of the bear, skull size, baiting, salvage of meat, incidental take, and defense of life or property. A premolar was extracted from most of the bears during the sealing process; however, black bear teeth have not been sectioned or aged for several years. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY00 = 1 Jul 2000–30 Jun 2001).

In summer 2000 we established 5 permanent blueberry sample areas in Unit 12 and 3 in adjacent Unit 20E to assess annual blueberry abundance. Each area has 5 1-m^2 plots. Sample areas and individual plots were not selected randomly but by the presence of blueberry plants. We selected for a variety of habitat types, aspects, elevations, and slopes. We placed a rain gauge at each site. Each year we will monitor rainfall and temperatures to determine the effects on blossom and berry production. To measure berry production, we will count the number of berries within each plot at the same time each year. Over time we hope to compare berry production between years and sites and evaluate the effects of berry abundance on bear harvest and the number of problem bear incidents.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

During RY98–RY00 no population surveys were conducted in Unit 12 to determine the black bear population size and trend. Based on limited radiotelemetry data collected in Unit 12 (Kelleyhouse 1990) and on more rigorous data collected in Unit 20A (Hechtel 1991), I estimated the black bear density in Unit 12 at 16–22 bears/100 mi^2 of black bear habitat and the population size was 700–1000 bears. During RY98–RY00, harvest was estimated to be sustainable and no substantial climatic anomalies or habitat alterations occurred. Population trend was probably stable.

Population Composition

Few data were available on population composition in Unit 12. Sex ratios in the harvest were not representative of the population because females with cubs were protected by regulation. During RY96–RY00 productivity of the black bear population in Unit 12 appeared adequate based on the age structure of the harvest and on numerous sightings of family groups. The reproductive interval (length of time between parturition and weaning), determined by observations of radiocollared bears, was 2–3 years (Kelleyhouse 1990). This was similar to other black bear populations in Interior Alaska (Miller 1987).

Distribution and Movements

Black bears were distributed throughout the forested areas that included approximately 4500 mi^2 of Unit 12. In fall and spring bears moved into the shrub zones to feed on berries and succulent vegetation. In 1990 a forest fire burned approximately 156 mi^2 of black bear habitat in the Tok River valley and reduced black bear use of the area. By 1994 bears began using the edges of the burn for feeding. Beginning in 1997 incidental sightings indicated black bears were utilizing most areas of the burn.

Kelleyhouse (1990) investigated black bear movements in a portion of Unit 12. He reported home ranges of 16 mi^2 for an adult female (29 relocations over 3 summers), 3 mi^2 for a subadult male (7 relocations over 1 summer), and 63 mi^2 for an adult male (15 relocations over 1 year).

MORTALITY

Harvest

Season and Bag Limit. There was no closed season for black bears in Unit 12, and the bag limit was 3 bears. Harvest of cubs (in first year of life) or females accompanied by cubs was prohibited.

Alaska Board of Game Actions and Emergency Orders. In January 2000 the Alaska Board of Game adopted a regulation requiring hunters who used bait stations registered by another hunter to obtain written permission from that hunter and to place their own hunting license number at the site. In January 1998 the board adopted a regulation allowing the sale of handcrafted items made from black bear fur. In January 1996 the board Game adopted a regulation requiring the salvage of meat, hides, and skulls from black bears harvested during 1 January–31 May in units requiring sealing, which includes Unit 12.

Hunter Harvest. During RY98–RY00, 27–47 ($\bar{x}$ = 38) black bears were harvested (Table 1). Estimated harvest rate was 3–7%. Since RY92 black bear harvest has increased. During this 9-year period the average annual harvest was 36.7 bears, compared to 25.1 bears from RY80–RY91. During RY98–RY00, males composed 65–74% of the harvest ($\bar{x}$ = 69%), meeting the harvest objective. The previous 5-year average was 78% males.

Mean skull size of males taken during RY98–RY00 was 16.2–16.5 inches ($\bar{x}$ = 16.4 inches). Increased harvest since RY92 has not affected male skull size. Average skull size of harvested male black bears in Unit 12 has remained consistent since RY80. During RY92 through RY97, average skull size was 16.4 inches (s = 0.326), compared to 16.4 inches (s = 0.437) during RY80 through RY91.

About 80% of black bear harvest in Unit 12 occurred along the road system within the Tok and Tanana River valleys. Few hunters accessed remote portions of Unit 12 to hunt black bear.

Circumstantial evidence indicates that berry abundance may affect bear harvest. During years of poor berry production, bears may travel more in search of berries and/or may be more attracted to hunter-killed moose or caribou or other human foods. These behaviors increase the vulnerability of bears to hunters. Black bear harvest in fall RY96 was the second highest fall harvest since RY74. Berries were not plentiful in 1996 due to freezing conditions during spring and drought conditions throughout spring and summer. In addition to a high harvest, 4 bears were shot that fall in defense of life or property when coming into homes or camps.

In an attempt to better evaluate bear harvest in relation to berries, we established 5 blueberry sample areas in Unit 12 and 3 in adjacent Unit 20E during July 2000 (Table 2). Two years of data are presented in Table 3. These data and discussions with local berry pickers, hunters, and hikers, indicate blueberries were locally abundant in 2000 but were sparse overall. Blueberries were more abundant in all habitats in 2001. We will monitor berry abundance, berry quality in

terms of sugar content, and total rainfall within these plots annually to determine if there is a correlation between berry abundance and quality, and bear harvest.

Hunter Residency and Success. During RY98–RY00 Alaska residents harvested 89–93% ($\bar{x}$ = 90%) of the black bears taken in Unit 12 (Table 4). Of these, Unit 12 residents took 63–67% ($\bar{x}$ = 65%). During the previous 5 years, the average annual percent harvest for Alaska residents was 92%. The average percent harvest by Unit 12 residents was 73%. Historically nonresidents have harvested few black bears in Unit 12. During RY90 through RY95 nonresidents took an average of 1 black bear/year (0–8% annual harvest). Since RY96 average annual harvest increased to 3.8 bears/year or 11% of the harvest. Guided nonresidents harvested 55% of the bears killed by nonresidents.

No measure of hunter success was available because unsuccessful hunters were not required to report. During RY98–RY00 successful hunters spent an average of 2.7 and 4.9 days afield hunting black bears during the fall and spring, respectively. The fewer days afield during the fall by successful hunters reflected that most hunters harvested black bears incidentally to hunting other species. The yearly average time spent hunting black bears during RY98–RY00 was 4.2 days and during RY95–RY00 the average was 3.8 days. During RY90–RY94 the average number of days afield was 8.7 days. The differences between the periods was probably improved success at bait stations and increased satisfaction by hunters harvesting only 1 bear. During RY95–RY00, 15.5% of hunters took >1 bear compared to 28.0% during RY90–RY94. The average number of hunters who took >1 bear per year declined from 4.0 to 2.8.

Harvest Chronology. During RY98–RY00 the average percent of the harvest taken during the spring was 68% (Table 5). This was below the RY93–RY97 mean of 74%.

During RY98–RY00 hunters at bait stations accounted for an average of 63% of the spring harvest, compared to 61% (11–27 bears) during RY93–RY97. The use of bait stations by successful hunters increased substantially in 1992. During RY89 and RY91, 45% of the spring harvest was taken over bait (5–8 bears). Most fall harvest (60–75%) was incidental to hunts for other species.

Transport Methods. Highway vehicles were the most commonly used (annual $\bar{x}$ = 44%) mode of transportation for successful black bear hunters during RY98–RY00 (Table 6). During RY93–RY97, hunters who used highway vehicles killed an annual average of 46% of the black bears reported taken. Most black bear baiting occurred in areas accessible by highway vehicles. Unless the harvest success rate declines in these areas, the use of other transportation types will remain low.

Other Mortality

Most black bear mortality in Unit 12 is natural rather than human-caused. There is no data on mortality rate of cubs in this area; however, Miller (1987) found that cubs of the year had a natural mortality rate of 35% in the Susitna Basin.

HABITAT

Assessment

Approximately one-half of Unit 12 is suitable black bear habitat. Because grizzly bears are moderately abundant and are an important source of mortality for black bears of all age classes (Miller 1987), they limit black bear distribution to areas offering adequate escape cover. Berry species used by black bears in Unit 12 are generally available throughout the unit. Their annual abundance is directly affected by climate. The Tok wildfire in 1990 burned approximately 156 mi^2 of prime black bear habitat. Its initial impact on the local black bear population is unknown, but suitable black bear food sources are increasing annually, and based on incidental sightings more black bears are using the area.

Enhancement

The implementation of the Alaska Interagency Fire Management Plan and the 1990 Tok wildfire are expected to enhance black bear habitat over the long term in Unit 12. Extensive areas of climax black spruce forest exist in the unit with understories nearly devoid of high-quality black bear food. A younger, more diverse habitat mosaic will provide more productive food plants preferred by black bears.

CONCLUSIONS AND RECOMMENDATIONS

During the report period we met the management goals and objective. In Unit 12 an average of 90% of the black bear harvest was by Alaska residents, of which 65% were local residents. Most bears were taken in spring (68%) over bait (63%). Black bear meat was an important food source for local residents, particularly in the spring. Based on hunter report data and public and departmental sightings, there was no indication that harvest was excessive. The percentages of males in the harvest were high ($\bar{x}$ = 69%). Average male skull size was 16.4 inches and has remained consistent since 1980. I recommend no changes in the seasons and bag limits or management goals and objectives.

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Table 1 Unit 12 black bear harvest, regulatory years 1990–1991 through 2000–2001

Regulatory year	Reported								Estimated kill		Total reported and estimated kill							
	Hunter kill					Nonhunting kill[a]												
	M	F	Unk	Total	Baited	M	F	Unk	Unreported	Illegal	M	(%)	F	(%)	Unk	(%)	Total
1990–1991																		
Fall 1990	5	1	0	6	0	0	0	0	0	0	5	(83)	1	(17)	0	(0)	6
Spring 1991	12	5	1	18	5	0	0	0	0	0	12	(67)	5	(28)	1	(5)	18
Total	17	6	1	24	5	0	0	0	0	0	17	(71)	6	(25)	1	(4)	24
1991–1992																		
Fall 1991	3	0	0	3	0	0	0	0	0	0	3	(100)	0	(0)	0	(0)	3
Spring 1992	12	3	0	15	8	0	0	0	0	0	12	(80)	3	(20)	0	(0)	15
Total	15	3	0	18	8	0	0	0	0	0	15	(82)	3	(18)	0	(0)	18
1992–1993																		
Fall 1992	8	3	1	12	0	0	0	0	0	0	8	(67)	3	(25)	1	(8)	12
Spring 1993	17	6	0	23	14	0	0	0	0	0	17	(74)	6	(26)			23
Total	25	9	1	35	14	0	0	0	0	0	25	(71)	9	(26)	1	(3)	35
1993–1994																		
Fall 1993	3	0	1	4	0	4	1	0	0	0	7	(78)	1	(11)	1	(11)	9
Spring 1994	17	6	0	23	13	0	0	0	0	0	17	(74)	6	(26)	0	(0)	23
Total	20	6	1	27	13	4	1	0	0	0	24	(75)	7	(22)	1	(3)	32
1994–1995																		
Fall 1994	7	0	0	7	0	0	0	0	0	0	7	(100)	0	(0)	0	(0)	7
Spring 1995	23	4	0	27	13	0	0	0	0	0	23	(85)	4	(15)	0	(0)	27
Total	30	4	0	34	13	0	0	0	0	0	30	(88)	4	(12)	0	(0)	34
1995–1996																		
Fall 1995	5	3	0	8	0	0	0	0	0	0	5	(63)	3	(37)	0	(0)	8
Spring 1996	17	6	0	23	11	0	0	0	0	0	17	(74)	6	(26)			23
Total	22	9	0	31	11	0	0	0	0	0	22	(71)	9	(29)	0	(0)	31
1996–1997																		
Fall 1996	21	2	0	23	0	0	1	0	0	0	21	(88)	3	(12)	0	(0)	24
Spring 1997	14	6	0	20	16	0	0	0	0	0	14	(70)	6	(30)	0	(0)	20
Total	35	8	0	43	16	0	1	0	0	0	35	(80)	9	(20)	0	(0)	44
1997–1998																		
Fall 1997	2	2	0	4	0	0	0	0	0	0	2	(50)	2	(50)	0	(0)	4
Spring 1998	30	7	0	37	27	0	0	0	0	0	30	(81)	7	(19)	0	(0)	37
Total	32	9	0	41	27	0	0	0	0	0	32	(78)	9	(22)	0	(0)	41
1998–1999																		

Regulatory year	Reported								Estimated kill		Total reported and estimated kill							
	Hunter kill					Nonhunting kill[a]					M (%)		F (%)		Unk (%)		Total	
	M	F	Unk	Total	Baited	M	F	Unk	Unreported	Illegal								
Fall 1998	8	3	0	11	0	0	0	0	0	0	8	(73)	3	(27)	0	(0)	11	
Spring 1999	19	10	0	29	18	0	0	0	0	0	19	(66)	10	(34)	0	(0)	29	
Total	27	13	0	40	18	0	0	0	0	0	27	(68)	13	(32)	0	(0)	40	
1999–2000																		
Fall 1999	7	2	0	9	0	0	0	0	0	0	7	(78)	2	(22)	0	(0)	9	
Spring 2000	13	5	0	18	11	0	0	0	0	0	13	(72)	5	(28)	0	(0)	18	
Total	20	7	0	27	11	0	0	0	0	0	20	(74)	7	(26)	0	(0)	27	
2000–2001																		
Fall 2000	13	3	0	16	0	0	0	0	0	0	13	(81)	3	(19)	0	(0)	16	
Spring 2001	18	13	0	31	21	0	1	0	0	0	18	(56)	14	(44)	0	(0)	32	
Total	31	16	0	47	21	0	1	0	0	0	31	(65)	17	(35)	0	(0)	48	

[a] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Blueberry sample areas in Units 12 and 20E

Area	Unit	Elevation	Aspect	Slope	Primary vegetation
Clearwater	12	1966	Flat	Flat	spruce/muskeg
7-Mile	12	1859	Flat	Flat	spruce/willow
Pipeline	12	1888	5–10[a]	SSW	spruce/willow
RCA	12	2197	15–20[a]	N	spruce/alder
4-Mile	12	2300	5–10[a]	S	spruce/tussock
9-Mile	20E	2722	5–10[a]	NE	1990 burn/willow
Ptarmigan	20E	3643	10–15[a]	W	willow/alder
Fairplay	20E	3640	10[a]	SW	willow

Table 3 Blueberry production in 8 sample units in Units 12 and 20E, 2000–2001

Calendar year	Sample units[a]								Bear harvest[b]	DLP[b,c]
	Clearwater	7-Mile	Pipeline	RCA	4-Mile	9-Mile	Fairplay Ptarmigan	Fairplay 2		
2000	137 (33.6)	3 (0.89)	19 (5.76)	7 (1.95)	55 (2.55)	51 (6.30)	124 (24.31)	46 (9.42)	47	3
2001	285 (64.36)	23 (4.34)	278 (55.86)	23 (3.13)	356 (36.09)	400 (26.24)	379 (79.05)	599 (109.69)	18	0

[a] Numbers in parentheses is the variance among plots within a study area.
[b] Unit 12 only.
[c] Number of DLP bears also include any bears harvested in July.

Table 4 Unit 12 successful black bear hunter residency, regulatory years 1990–1991 through 2000–2001

Regulatory year	Unit resident (%)	Other residents (%)	Nonresident (%)	Total successful hunters[a]
1990–1991	15 (63)	7 (29)	2 (8)	24
1991–1992	10 (56)	8 (44)	0 (0)	18
1992–1993	26 (74)	8 (23)	1 (3)	35
1993–1994	21 (78)	5 (19)	1 (3)	27
1994–1995	24 (73)	8 (24)	1 (3)	34
1995–1996	20 (69)	8 (28)	1 (3)	29
1996–1997	32 (73)	7 (16)	5 (11)	44
1997–1998	27 (73)	5 (14)	5 (14)	41
1998–1999	25 (63)	12 (30)	3 (8)	40
1999–2000	18 (67)	6 (22)	3 (11)	27
2000–2001	30 (64)	12 (26)	5 (11)	47

[a] Total may include hunters who did not specify whether or not they were residents.

Table 5 Unit 12 black bear harvest chronology percent by month, regulatory years 1990–1991 through 2000–2001

Regulatory year	Harvest chronology percent by month								
	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
1990–1991	0	4	21	0	0	0	54	21	24
1991–1992	0	6	6	0	0	0	41	47	17
1992–1993	3	11	20	0	0	3	46	17	35
1993–1994	0	7	7	0	0	0	41	44	27
1994–1995	7	7	10	0	0	0	33	43	34
1995–1996	7	10	10	0	0	0	38	34	29
1996–1997	9	7	36	0	0	0	39	9	44
1997–1998	5	0	5	0	0	0	71	20	41
1998–1999	0	8	20	0	0	0	58	15	40
1999–2000	0	15	19	0	0	0	33	33	27
2000–2001	4	11	19	0	0	2	43	21	47

Table 6 Unit 12 black bear harvest by transport method, regulatory years 1990–1991 through 2000–2001

Regulatory year	Harvest by transport method (%)									*n*
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walking	Unknown	
1990–1991	1 (4)	1 (4)	2 (8)	3 (13)	0 (0)	0 (0)	12 (50)	0 (0)	5 (21)	24
1991–1992	1 (6)	0 (0)	1 (6)	2 (12)	0 (0)	0 (0)	13 (71)	0 (0)	1 (5)	18
1992–1993	3 (9)	0 (0)	4 (11)	7 (20)	0 (0)	2 (6)	16 (46)	1 (3)	2 (6)	35
1993–1994	1 (3)	0 (0)	1 (3)	9 (33)	0 (0)	1 (3)	11 (41)	1 (3)	1 (3)	27
1994–1995	2 (6)	1 (3)	3 (9)	7 (21)	0 (0)	1 (3)	12 (35)	7 (21)	1 (3)	34
1995–1996	2 (7)	1 (3)	1 (3)	4 (14)	0 (0)	0 (0)	16 (55)	5 (17)	0 (0)	29
1996–1997	5 (11)	1 (2)	2 (5)	8 (18)	0 (0)	0 (0)	19 (43)	6 (14)	3 (7)	44
1997–1998	0 (0)	0 (0)	2 (5)	10 (24)	0 (0)	0 (0)	22 (54)	7 (17)	0 (0)	41
1998–1999	3 (8)	2 (5)	2 (5)	2 (5)	0 (0)	0 (0)	19 (48)	12 (30)	0 (0)	40
1999–2000	5 (19)	1 (4)	1 (4)	6 (22)	0 (0)	0 (0)	11 (41)	3 (11)	0 (0)	27
2000–2001	1 (2)	0 (0)	3 (6)	14 (30)	1 (2)	0 (0)	20 (43)	8 (17)	0 (0)	47

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 1998
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 20A, 20B, 20C, and 20F (34,079 mi^2)

GEOGRAPHIC DESCRIPTION: Central–Lower Tanana and Middle Yukon River drainages

BACKGROUND

Black bears live throughout Interior Alaska (approximately 2000–4000 in the 4 units discussed in this report); however, only a few studies of black bear ecology or population dynamics have been completed. During 1988–1991 a cooperative project conducted by ADF&G with support from the US Army yielded important information about black bear reproduction, mortality, and density on the Tanana Flats (Hechtel 1991). A portion of this project involved a study of habitat use and denning ecology of black bears (Smith 1994). In 1967 Hatler completed a master's thesis on Interior Alaska black bear ecology. Johnson (1982) investigated production of offspring by female black bears in Units 20A and 20B.

Black bears provide an important source of meat, hides, and recreation for hunters in some areas. With growth of the Fairbanks human population, interest in hunting black bears is increasing, especially during spring. More information about black bear ecology and population dynamics has helped ensure the current year-round season and 3-bear bag limit will not adversely affect the population.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect and maintain the black bear population and its habitat in concert with other components of the ecosystem.
- Provide the greatest sustained opportunity to participate in hunting black bears.
- Protect human life and property in human–bear interactions.

MANAGEMENT OBJECTIVES

Sex ratio of the harvest is a key indicator of appropriate levels of harvest used for management in these units; therefore, management objectives call for a minimum percentage of males in the harvest.

- Maintain a black bear population that sustains a harvest of at least 55% males in the combined harvests for the most recent 3 years in all units.

- Minimize human–bear conflicts by providing information and assistance to the public and to agencies.

METHODS

We collected annual harvest data from sealing reports of black bears killed by hunters and in defense of life and property. Black bear sealing certificates included data on kill date and location, sex, skull size, amount of meat salvaged, defense of life or property kills, hunter residency, incidental take, commercial services used, and baiting. We recorded the distribution of bears killed in the area using the Uniform Coding Units (UCUs). During sealing, we collected premolars and sent them to Matson's Laboratory (Milltown, Montana, USA) for sectioning and age determination.

Since 1989, hunters have been required to register bait stations before hunting black bears over bait in spring. We also prepared hunter information leaflets to summarize black bear baiting regulations, and encouraging hunters to harvest males instead of females.

There are some differences between annual harvest data reported here and annual harvest data reported previously. Prior to 1988, data were summarized by calendar year. Since 1988, data were summarized by regulatory year (RY), which runs from 1 July through 30 June (e.g., RY00 = 1 Jul 2000 through 30 Jun 2001).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Densities of northern black bears are relatively low compared to other areas. Current estimates for the number of black bears in the area included 500–700 bears in the Tanana Flats in Unit 20A, 750–1200 bears in Unit 20B, 700–1000 in the portion of Unit 20C outside Denali National Park, and 400–700 in Unit 20F (Boudreau 1995). Population estimates were calculated based on Hechtel's (1991) density estimate of 12–18 black bears/100 mi^2 (46–67/1000 km^2), excluding cubs of the year, inhabiting the Tanana Flats study area in 1989. The density estimate was then applied to the estimated amount of suitable black bear habitat in each unit. This density is similar to the estimate of 17 bears/100 mi^2 in the Susitna River area (Miller et al. 1987), but it is much lower than the 39–52 bears/100 mi^2 estimated to inhabit portions of the Kenai Peninsula (Schwartz and Franzmann 1991).

Population Composition

No estimate of population composition is available for this black bear population. Sex ratios in the harvest were not representative of sex ratios in the population because females with cubs were protected by regulation. In addition, behavioral differences of male and female bears may have resulted in higher vulnerability of males and many hunters are selective for adult males.

Distribution and Movements

The distribution of black bears shifts seasonally. During spring, bears use moist lowlands where early growing vegetation, especially *Equisetum,* is the bulk of their diet (Hatler 1967). Dispersal of young occurs in the spring usually before the breeding season. Immature males disperse longer distances from internal home ranges than immature females. During fall, black bears feed primarily on berries in open meadows or alpine areas. Mean home range sizes of marked black bears in the Tanana Flats were 23 mi^2 for adult females, 32 mi^2 for subadult females, 230 mi^2 for adult males, and 93 mi^2 for subadult males (Hechtel 1991).

MORTALITY

Harvest

Season and Bag Limit. The black bear hunting season was open year-round in Unit 20 with a bag limit of 3 bears (baiting was restricted to 15 Apr–30 Jun). Since July 1972 the taking of cubs (first year of life) and females accompanied by cubs has been prohibited.

Alaska Board of Game Actions and Emergency Orders. In January 2000 the Alaska Board of Game adopted a regulation requiring hunters who used bait stations registered by another hunter to obtain written permission from that hunter and to place their own hunting license number at the site. During January 1998 the board adopted a regulation allowing the sale of handcrafted items made from black bear fur. In January 1996 the board passed a regulation requiring the salvage of meat, hides, and skulls from black bears harvested during 1 January–31 May in units requiring sealing.

Hunter Harvest. The annual black bear harvest in Unit 20A was relatively stable during RY95 through RY00, averaging 57 bears with a range of 50–60 bears (Table 1). The 3-year (RY98 through RY00) combined harvest was 165 bears, with 59% (104 of 166) males.

During the last 5 years (RY96 through RY00), the average annual harvest of black bears in Unit 20B was 161 bears with a range of 147–174 (Table 1). The 3-year (RY98 through RY00) combined harvest was 470 bears, with 59% (278 of 470) males.

During the last 5 years (RY96 through RY00), the average annual harvest of black bears in Unit 20C was 43 bears with a range of 35–48 (Table 1). The 3-year (RY98 through RY00) combined harvest was 140 bears, with 65% (91 of 140) males.

During the last 5 years (RY96 through RY00), the average annual harvest of black bears in Unit 20F was 38 bears with a range of 31–48 (Table 1). The 3-year (RY98 through RY00) combined harvest was 117 bears, with 70% (82 of 117) males.

The average annual reported harvest in all units from RY84 through RY95 was 203 bears, compared to an average annual reported harvest of 298 bears during RY96 through RY00. The increasing harvest trend in recent years is attributed to the increase in spring harvests associated with bear baiting. The average percentage of males in the harvest during these periods was 67% (1585 of 2391) and 63% (933 of 1486), respectively.

The estimated maximum sustainable exploitation rate is approximately 12% for Interior black bear populations (Hechtel 1991). Based on our population estimates for each of the units and the mean harvest during the last 3 regulatory years, we estimated the proportion of black bears harvested was approximately 8–11% in Unit 20A, 13–21% in Unit 20B, 5–7% in Units 20C, and 6–10% in Unit 20F.

Distribution of Harvest. Most black bear harvest was within the road-accessible portions of Unit 20B. Bait stations were more prevalent along the road system because of the difficulty of transporting heavy, bulky bait. The distribution of harvests reflected this trend. Other trends in harvest included increased participation in black bear hunting, and hunters traveling farther away from the road system and from Fairbanks to hunt black bears, possibly to avoid crowding by other hunters.

Nonresident military hunters can hunt black bears without purchasing a big game tag or license if they hunt on military land. Therefore, military land such as the Yukon Maneuver Area in Unit 20B and the Fort Wainwright land in Unit 20A were hunted intensively. Approximately half of the bear harvest in these areas was by military personnel.

Registration of Bait Stations. Regulations for hunting black bears at bait stations changed several times during the last 20 years. Prior to RY81, black bear baiting was legal with minimal regulations. From mid-1982 through 1983, permits were required to hunt bears at bait stations. From RY84 through RY87, baiting was legal without permits or restrictions in season. Since RY88, black bear hunters have been limited to baiting during the spring season, and have been required to register their bait stations prior to setting them up, have no more than 2 bait stations, and post a sign at bait stations with their hunting license number. Other hunters using these bait stations have been required to add their license number to the bait station sign. In addition, baiting was restricted to 15 April–15 June during RY89, but extended to 15 April–30 June during RY90 through RY01 in response to the later emergence of bears from hibernation north of the Alaska Range.

The number of hunters who registered black bear bait stations increased from 220 hunters registering 314 bait stations in spring 1989, when registration became mandatory, to a peak of 615 hunters registering 1154 bait stations in spring 1993 (Table 2).

Harvest at Bait Stations. Since RY90, 72% of the black bear harvest in Unit 20 occurred at bait stations (Table 2), and from RY98 through RY00, 76% (668 of 883) of the black bear harvest occurred at bait stations.

Hunter Residency and Success. During RY98 through RY00, most black bear harvest (77–81%) was by residents of Alaska, and 75–78% of the state residents were residents of Unit 20

(Table 3). Because only successful hunters were required to report, we have no data on unsuccessful hunters in order to determine the success rate.

Harvest Chronology. From RY98 through RY00, 81% of the harvest occurred during May and June, which coincides with den emergence and the baiting season (Table 4). Factors that influenced harvest chronology for black bears included the opportunity to use bait, vulnerability of bears, hide quality, and seasonal activity of hunters.

Transport Methods. From RY98 through RY00, the most common methods of transportation used (listed in descending order) by successful black bear hunters in Units 20A and 20C were boats, airplanes, and 4-wheelers, while in Units 20B and 20F, 4-wheelers, highway vehicles, and boats were the most used methods (Table 5).

Defense of Life or Property. The number of black bears taken in defense of life or property (DLP) was probably higher than reported. A year-round season, a bag limit of 3 black bears, and requirements associated with DLP kills probably resulted in black bears reported as sport-harvested bears that would otherwise be reported under DLP provisions. Our records indicated that during the last 3 years, 5 black bears were recorded as DLPs.

Other Mortality

Causes of natural mortality of black bears include predation, food shortages that result in undernourished cubs and yearlings (Rogers 1977), and flooding of natal dens (Alt 1984). Hechtel (1991) reported several instances of natural mortality. During the spring 1996 recollaring effort, a bear died after being immobilized, but necropsy results revealed the presence of extensive cancerous tissue in several internal organs.

Bear baiting has become an important issue for antihunting groups in the western United States. These efforts have been successful in eliminating this black bear hunting method in some western states, especially during the spring. Such campaigns have sometimes been predicated on the likelihood of cubs being orphaned when their mothers are killed at bait stations or during spring hunts. Our records show little incidence of this result, despite the fact that most harvest takes place during May and June (Table 4). The practice in Alaska will probably continue to receive close scrutiny.

CONCLUSIONS AND RECOMMENDATIONS

We met our management objectives for sex ratio of the black bear harvests. The average percent males in the harvest for the 3 most recent years (RY98 through RY00) ranged from 59% in Units 20A and 20B to 70% in Unit 20F, which was above the minimum objective of 55%.

Based on the population estimates for the individual units, the average annual harvest rates for the last 3 years (RY98 through RY00) were below the maximum sustainable exploitation rate of 12% in Units 20A (8–11%), 20C (5–7%), and 20F (6–10%). In Unit 20B the average annual harvest rate was 13–21% of the estimated population during RY98 through RY00, exceeding the maximum sustained exploitation rate for the second consecutive 3-year period (harvest rate was 14–22% of the estimated population during RY95 through RY97). A possible explanation for the

high Unit 20B rates was a low population estimate for Unit 20B because it was calculated by extrapolating Unit 20A data. However, additional evidence that indicates we may be at, or exceeding sustainable harvests in Unit 20B is that the percent males in the harvest decreased from 65% in RY98 to 55% in RY00. I recommend we closely monitor the harvest in Unit 20B and be prepared to recommend regulatory changes if these trends continue during the next report period.

We met our objective of minimizing bear–human conflicts in the Fairbanks area. High black bear harvest reduced the potential for problems. We also provided the public with information and worked to reduce the need for DLP kills. We should continue to closely monitor public interest in black bear hunting and subsequent harvest. As an important part of this monitoring, I recommend teeth from harvested black bears continue to be processed to provide age structure data.

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Table 1 Units 20A, 20B, 20C and 20F black bear harvest[a], regulatory years 1984–1985 through 2001–2002

Regulatory		Fall				Spring				Annual total			
year	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1984–1985	20A	13	18	0	31	8	2	0	10	21	20	0	41
	20B	24	20	1	45	22	15	1	38	46	35	2	83
	20C	7	1	0	8	1	0	0	1	8	1	0	9
	20F	4	4	1	9	2	2	0	4	6	6	1	13
	Total	48	43	2	93	33	19	1	53	81	62	3	146
		(53%)				(63%)				(57%)			
1985–1986	20A	6	2	0	8	4	2	0	6	10	4	0	14
	20B	14	13	0	27	46	21	0	67	60	34	0	94
	20C	2	1	0	3	3	2	1	6	5	3	1	9
	20F	0	2	0	2	3	2	0	5	3	4	0	7
	Total	22	18	0	40	56	27	1	84	78	45	1	124
		(55%)				(67%)				(63%)			
1986–1987	20A	10	9	0	19	11	2	1	14	21	11	1	33
	20B	31	12	3	46	40	32	2	74	71	44	5	120
	20C	1	1	0	2	3	2	0	5	4	3	0	7
	20F	1	1	0	2	2	1	0	3	3	2	0	5
	Total	43	23	3	69	56	37	3	96	99	60	6	165
		(65%)				(60%)				(62%)			
1987–1988	20A	16	11	1	28	5	7	0	12	21	18	1	40
	20B	36	15	5	56	36	30	1	67	72	35	6	113
	20C	6	5	0	11	9	2	1	12	15	7	1	23
	20F	1	2	1	4	5	2	0	7	6	4	1	11
	Total	59	33	7	99	55	41	2	98	114	64	9	187
		(64%)				(57%)				(64%)			
1988–1989	20A	8	5	0	13	14	5	1	20	22	10	1	33
	20B	22	4	0	26	54	27	0	81	76	31	0	107
	20C	3	4	0	7	5	1	0	6	8	5	0	13
	20F	5	1	0	6	3	7	0	10	8	8	0	16
	Total	38	14	0	52	76	40	1	117	114	54	1	169
		(73%)				(66%)				(68%)			
1989–1990	20A	7	3	1	11	8	6	0	14	15	9	1	25
	20B	13	4	0	17	49	23	0	72	62	27	0	89
	20C	6	3	0	9	3	1	0	4	9	4	0	13
	20F	3	0	0	3	6	2	0	8	9	2	0	11
	Total	29	10	1	40	66	32	0	98	95	42	1	138
		(74%)				(67%)				(69%)			
1990–1991	20A	7	3	0	10	19	11	0	30	26	14	0	40
	20B	6	7	0	13	93	49	2	144	99	56	2	157
	20C	4	1	0	5	14	5	2	19	18	6	2	26
	20F	3	2	0	5	18	7	0	25	21	9	0	30
	Total	20	13	0	33	144	72	4	220	164	85	4	253
		(61%)				(67%)				(66%)			
1991–1992	20A	9	5	1	15	13	5	0	18	22	10	1	33
	20B	11	8	1	20	47	28	6	81	58	36	7	101
	20C	3	2	0	5	12	3	2	17	15	5	2	22
	20F	4	3	0	7	12	4	0	16	16	7	0	23
	Total	27	18	2	47	84	40	8	132	111	58	10	179
		(60%)				(68%)				(62%)			
1992–1993	20A	13	8	0	21	27	16	0	43	40	24	0	64
	20B	25	11	0	36	74	48	0	122	99	59	0	158

Regulatory year	Area	Fall				Spring				Annual total			
		Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
	20C	12	2	0	14	6	1	1	8	18	3	1	22
	20F	5	3	0	8	19	12	0	31	24	15	0	39
	Total	55	24	0	79	126	77	1	204	181	101	1	283
		(70%)				(62%)				(63%)			
1993–1994	20A	6	9	0	15	21	10	1	32	27	19	1	47
	20B	9	6	1	16	81	38	3	122	90	44	4	138
	20C	3	0	0	3	12	4	1	17	15	4	1	20
	20F	2	2	0	4	28	9	0	37	30	11	0	41
	Total	20	17	1	38	142	61	5	208	162	78	6	246
		(53%)				(70%)				(66%)			
1994–1995	20A	6	1	0	7	31	5	0	36	37	6	0	43
	20B	11	3	0	14	111	51	1	163	122	54	1	177
	20C	3	2	0	5	13	3	0	16	16	5	0	21
	20F	2	2	0	4	28	14	0	42	30	16	0	46
	Total	22	8	0	30	183	73	1	257	205	81	1	287
		(73%)				(71%)				(71%)			
1995–1996	20A	9	1	1	11	24	15	1	40	33	16	2	51
	20B	14	6	0	20	103	39	0	142	117	45	0	162
	20C	5	0	0	5	5	2	0	7	10	2	0	12
	20F	1	0	0	1	20	13	0	33	21	13	0	34
	Total	29	7	1	37	152	69	1	222	181	76	2	259
		(81%)				(69%)				(70%)			
1996–1997	20A	15	16	0	31	17	10	0	27	32	26	0	58
	20B	25	14	1	40	81	53	0	134	106	67	1	174
	20C	12	7	0	19	18	4	0	22	30	11	0	41
	20F	5	0	0	5	22	13	0	35	27	13	0	40
	Total	57	37	1	95	138	80	0	218	195	117	1	313
		(61%)				(63%)				(63%)			
1997–1998	20A	9	8	0	17	30	12	1	43	39	20	1	60
	20B	12	8	1	21	98	40	0	138	110	48	1	159
	20C	3	3	0	6	15	13	1	29	18	16	1	35
	20F	2	0	0	2	21	8	0	29	23	8	0	31
	Total	26	19	1	46	164	73	2	239	190	92	3	285
		(58%)				(69%)				(67%)			
1998–1999	20A	9	6	0	15	27	15	0	42	36	21	0	57
	20B	20	11	0	31	75	41	0	116	95	52	0	147
	20C	3	5	0	8	30	10	0	40	33	15	0	48
	20F	2	5	0	7	30	11	0	41	32	16	0	48
	Total	34	27	0	61	162	77	0	239	196	104	0	300
		(56%)				(68%)				(65%)			
1999–2000	20A	10	6	0	16	17	17	0	34	27	23	0	50
	20B	5	10	0	15	82	52	0	134	87	62	0	149
	20C	2	2	0	4	29	13	0	42	31	15	0	46
	20F	2	2	0	4	27	5	0	32	29	7	0	36
	Total	19	20	0	39	155	87	0	242	174	107	0	281
		(49%)				(64%)				(62%)			
2000–2001	20A	11	10	0	21	23	14	0	37	34	24	0	58
	20B	20	12	0	32	76	66	0	142	96	78	0	174
	20C	8	0	0	8	19	19	0	38	27	19	0	46
	20F	4	2	0	6	17	10	0	27	21	12	0	33
	Total	43	24	0	67	135	109	0	244	178	133	0	311
		(64%)				(55%)				(57%)			

Regulatory		Fall				Spring				Annual total			
year	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
2001–2002[b]	20A	10	9	0	19								
	20B	11	13	0	24								
	20C	3	2	0	5								
	20F	1	1	0	2								
	Total	25 (50%)	25	0	50								

[a] Includes bears killed in defense of life or property. Parentheses indicate percentage of bears of known sex that were male. Data for 1989–1992 from counts of sealing certificates.
[b] Preliminary data.

Table 2 Units 20A, 20B, 20C, and 20F black bear bait station registration and harvest, regulatory years 1990–1991 through 2001–2002

			Harvest		
Regulatory year	Hunters registering bait stations	Bait stations	Taken over bait (%)	Not taken[a] over bait (%)	Total harvest[b]
1990–1991	358	570	175 (70)	76 (30)	251
1991–1992	450	767	118 (66)	62 (34)	180
1992–1993	615	1154	176 (64)	100 (36)	276
1993–1994	542	901	175 (73)	66 (27)	241
1994–1995	575	899	221 (79)	59 (21)	280
1995–1996	593	958	190 (73)	69 (27)	259
1996–1997	596	951	197 (63)	116 (37)	313
1997–1998	n/a	n/a	217 (76)	68 (24)	285
1998–1999	544	831	217 (73)	80 (27)	297
1999–2000	597	863	224 (81)	51 (19)	275
2000–2001	562	798	227 (73)	84 (27)	311
2001–2002[C]	584	1083			

[a] Not taken over bait harvest includes bears taken outside of the baiting season.
[b] Total harvest does not include harvest where baited or unbaited was unknown.
[c] Preliminary data.

Table 3 Units 20A, 20B, 20C, and 20F successful hunter residency, regulatory years 1989–1990 through 2001–2002

Regulatory	Residents					Total successful
year	Local[a] (%)	Nonlocal (%)	Total (%)	Nonresident	Unk (%)	hunters[b]
1989–1990	127 (91)	5 (4)	132 (94)	7 (5)	1 (1)	140
1990–1991	221 (89)	8 (3)	229 (92)	18 (7)	1 (<1)	248
1991–1992	133 (76)	30 (17)	163 (93)	12 (7)	0	175
1992–1993	234 (82)	14 (5)	248 (87)	27 (9)	12 (4)	287
1993–1994	211 (84)	12 (5)	223 (89)	19 (8)	8 (3)	250
1994–1995	258 (89)	10 (3)	268 (92)	16 (6)	6 (2)	290
1995–1996	226 (87)	19 (7)	245 (95)	14 (5)	0 (0)	259
1996–1997	260 (83)	18 (6)	278 (89)	34 (11)	1 (<1)	313
1997–1998	238 (84)	16 (6)	254 (89)	30 (11)	1 (<1)	285
1998–1999	231 (78)	11 (4)	242 (81)	54 (18)	1 (<1)	297
1999–2000	206 (75)	6 (2)	212 (77)	63 (23)	0 (0)	275
2000–2001	235 (76)	11 (4)	246 (79)	65 (21)	0 (0)	311
2001–2002[c]	38 (76)	6 (12)	44 (88)	6 (12)	0 (0)	50

[a] Resident of Unit 20.
[b] Excludes data from DLPs that were not taken as a legal harvest.
[c] Preliminary data.

Table 4 Units 20A, 20B, 20C, and 20F black bear harvest chronology by month, regulatory years 1995–1996 through 2000–2001

Unit	Regulatory year	Harvest chronology by month (%)						
		May	Jun	Jul	Aug	Sep	Other	*n*
20A	1995–1996	19 (37)	21 (41)	1 (2)	1 (2)	9 (18)	0 (0)	51
	1996–1997	14 (24)	13 (22)	4 (7)	3 (5)	24 (41)	0 (0)	58
	1997–1998	30 (50)	13 (22)	0 (0)	4 (7)	13 (22)	0 (0)	60
	Subtotal (%)	63 (37)	47 (28)	5 (3)	8 (5)	46 (27)	0 (0)	169 (20)
	1998–1999	23 (40)	19 (33)	3 (5)	1 (2)	11 (19)	0 (0)	57
	1999–2000	17 (34)	16 (32)	3 (6)	3 (6)	11 (22)	0 (0)	50
	2000–2001	14 (24)	23 (40)	0 (0)	5 (9)	16 (28)	0 (0)	58
	Subtotal (%)	54 (33)	58 (35)	6 (4)	9 (5)	38 (23)	0 (0)	165 (18)
20B	1995–1996	62 (38)	80 (49)	2 (1)	2 (1)	16 (10)	0 (0)	162
	1996–1997	53 (30)	81 (47)	10 (6)	5 (3)	25 (14)	0 (0)	174
	1997–1998	73 (46)	65 (41)	2 (1)	3 (2)	15 (9)	1 (<1)	159
	Subtotal (%)	188 (38)	226 (46)	14 (3)	10 (2)	56 (11)	1 (<1)	495 (58)
	1998–1999	37 (25)	79 (54)	2 (1)	8 (5)	21 (14)	0 (0)	147
	1999–2000	41 (28)	93 (62)	1 (1)	3 (2)	11 (7)	0 (0)	149
	2000–2001	34 (20)	108 (62)	4 (1)	7 (4)	21 (12)	0 (0)	174
	Subtotal (%)	112 (24)	280 (60)	7 (1)	18 (4)	53 (11)	0 (0)	470 (53)
20C	1995–1996	2 (17)	5 (42)	0 (0)	0 (0)	5 (42)	0 (0)	12
	1996–1997	10 (24)	11 (27)	1 (2)	1 (2)	17 (41)	1 (2)	41
	1997–1998	19 (54)	10 (29)	1 (3)	0 (0)	5 (14)	0 (0)	35
	Subtotal (%)	31 (35)	26 (30)	2 (2)	1 (1)	27 (31)	1 (1)	88 (10)
	1998–1999	19 (40)	21 (44)	0 (0)	0 (0)	8 (17)	0 (0)	48
	1999–2000	13 (28)	29 (63)	0 (0)	2 (4)	2 (4)	0 (0)	46
	2000–2001	13 (28)	25 (54)	1 (2)	0	7 (15)	0 (0)	46

Unit	Regulatory year	Harvest chronology by month (%)						
		May	Jun	Jul	Aug	Sep	Other	*n*
	Subtotal (%)	45 (32)	75 (54)	1 (1)	2 (1)	17 (12)	0 (0)	140 (16)
20F	1995–1996	15 (44)	18 (53)	0 (0)	0 (0)	1 (3)	0 (0)	34
	1996–1997	15 (37)	20 (50)	0 (0)	1 (3)	4 (10)	0 (0)	40
	1997–1998	16 (52)	13 (42)	0 (0)	1 (3)	1 (3)	0 (0)	31
	Subtotal (%)	46 (44)	51 (49)	0 (0)	2 (2)	6 (6)	0 (0)	105 (12)
	1998–1999	20 (42)	21 (44)	3 (6)	0 (0)	4 (8)	0 (0)	48
	1999–2000	8 (22)	24 (66)	2 (6)	1 (3)	1 (3)	0 (0)	36
	2000–2001	2 (6)	25 (76)	0 (0)	2 (6)	4 (12)	0 (0)	33
	Subtotal (%)	30 (26)	70 (60)	5 (4)	3 (3)	9 (8)	0 (0)	117 (13)

Table 5 Units 20A, 20B, 20C, and 20F black bear harvest by transport method, regulatory years 1995–1996 through 2000–2001

Unit	Regulatory year	Harvest by transport method (%)									*n*
		Airplane	Horse	Boat	4-wheeler	Snowmachine	Other ORV	Highway vehicle	Walk	Other/ Unk	
20A	1995–1996	9 (18)	2 (4)	28 (55)	5 (10)	0 (0)	1 (2)	1 (2)	1 (2)	4 (8)	51
	1996–1997	6 (10)	0 (0)	29 (50)	18 (31)	0 (0)	0 (0)	2 (3)	1 (2)	2 (3)	58
	1997–1998	13 (22)	0 (0)	23 (38)	17 (28)	0 (0)	1 (2)	1 (2)	3 (5)	2 (2)	60
	1998–1999	12 (21)	0 (0)	22 (39)	10 (18)	0 (0)	0 (0)	5 (9)	7 (12)	1 (2)	57
	1999–2000	15 (30)	1 (2)	21 (42)	9 (18)	0 (0)	0 (0)	0 (0)	2 (4)	2 (4)	50
	2000–2001	15 (26)	0 (0)	20 (35)	15 (26)	0 (0)	1 (2)	4 (7)	2 (3)	1 (2)	58
20B	1995–1996	10 (6)	0 (0)	13 (8)	60 (37)	0 (0)	5 (3)	66 (41)	8 (5)	0 (0)	162
	1996–1997	11 (6)	0 (0)	33 (19)	60 (34)	0 (0)	1 (<1)	59 (34)	10 (6)	0 (0)	174
	1997–1998	9 (6)	0 (0)	38 (24)	59 (37)	0 (0)	0 (0)	41 (26)	10 (6)	2 (1)	159
	1998–1999	9 (6)	0 (0)	25 (17)	56 (38)	0 (0)	1 (1)	37 (25)	15 (10)	4 (3)	147
	1999–2000	10 (7)	0 (0)	26 (17)	57 (38)	0 (0)	1 (1)	41 (28)	14 (9)	0 (0)	149
	2000–2001	12 (7)	2 (1)	37 (21)	74 (43)	0 (0)	2 (1)	29 (17)	18 (10)	0 (0)	174
20C	1995–1996	5 (42)	0 (0)	5 (42)	2 (17)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12
	1996–1997	7 (17)	0 (0)	26 (63)	4 (10)	1 (2)	0 (0)	0 (0)	3 (7)	0 (0)	41
	1997–1998	4 (11)	0 (0)	27 (77)	2 (6)	0 (0)	0 (0)	1 (3)	0 (0)	1 (3)	35
	1998–1999	3 (6)	0 (0)	38 (79)	6 (13)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2)	48
	1999–2000	7 (15)	0 (0)	33 (72)	2 (4)	0 (0)	0 (0)	2 (4)	1 (2)	1 (2)	46
	2000–2001	10 (22)	1 (2)	25 (54)	7 (15)	0 (0)	0 (0)	0 (0)	2 (4)	1 (2)	46
20F	1995–1996	0 (0)	1 (3)	2 (6)	2 (6)	0 (0)	0 (0)	29 (85)	0 (0)	0 (0)	34
	1996–1997	2 (5)	0 (0)	4 (10)	10 (25)	0 (0)	3 (7)	19 (48)	2 (5)	0 (0)	40
	1997–1998	1 (3)	0 (0)	1 (3)	12 (39)	0 (0)	2 (6)	15 (48)	0 (0)	0 (0)	31
	1998–1999	1 (2)	0 (0)	10 (21)	15 (31)	0 (0)	0 (0)	17 (35)	5 (10)	0 (0)	48
	1999–2000	0 (0)	0 (0)	12 (33)	10 (28)	0 (0)	0 (0)	9 (25)	3 (8)	2 (6)	36
	2000–2001	0 (0)	0 (0)	5 (15)	14 (42)	0 (0)	0 (0)	5 (15)	9 (27)	0 (0)	33

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 1998
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 20D (5637 mi^2)

GEOGRAPHIC DESCRIPTION: Central Tanana Valley near Delta Junction

BACKGROUND

Black bears are widely distributed in Unit 20D. Most black bear harvest in Unit 20D occurs near the road system south of the Tanana River, in the northwestern portion of the subunit along the Richardson Highway, and along major river systems.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect, maintain, and enhance the black bear population and its habitat in concert with other components of the ecosystem.
- Provide the greatest sustained opportunity to participate in hunting black bears.

MANAGEMENT OBJECTIVE

- Manage for a sustained yield of black bears with harvest not to exceed 15 black bears south of the Tanana River and 35 black bears north of the Tanana River.

METHODS

I collected harvest data through mandatory sealing of bears killed by hunters, in defense of life or property, or from other sources such as road kill. Data collected from each black bear killed included color phase, sex, skull length and width, transportation used by the hunter, date of kill, number of days hunted, location of kill, hunter name and address, and whether the meat was salvaged. Data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY00 = 1 Jul 2000–30 Jun 2001).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

An accurate estimate of black bear population size and trend was not available for Unit 20D. However, based on Hechtel's (1991) estimate of 17.5 adult black bears/100 mi^2 in adjacent Unit 20A, I estimated approximately 750 adult black bears in Unit 20D. I also estimated that approximately 525 bears were north of the Tanana River and 225 bears were south of the Tanana River. Anecdotal information from residents and hunters in Unit 20D during RY98–RY00 indicated that black bears were numerous throughout the area.

Distribution and Movements

Black bears are distributed throughout Unit 20D except in the most heavily populated areas and in treeless alpine habitat. No information was available concerning movements.

MORTALITY

Harvest

Season and Bag Limit**.** There was no closed season on black bears in Unit 20D during RY98–RY00. The bag limit was 3 per year. Cubs or females accompanied by cubs were not legal to harvest. Black bear baiting was allowed from 15 April through 30 June; however, hunters using bait could not establish more than 2 bait stations and were required to acquire a permit issued by the Alaska Department of Fish and Game.

Alaska Board of Game Actions and Emergency Orders. In January 2000 the Alaska Board of Game adopted a regulation requiring hunters who used bait stations registered by another hunter to obtain written permission from that hunter and to place their own hunting license number at the site. In January 1998 the board adopted a regulation allowing the sale of handcrafted items made from black bear fur. In January 1996 the board passed a regulation requiring the salvage of meat, hides, and skulls from black bears harvested during 1 January–31 May in units requiring sealing.

Harvest by Hunters. Reported black bear harvest by hunters during RY98–RY00 ranged from a low of 18 in RY99 to a high of 37 in RY00 (Table 1) and did not exceed the Unit 20D combined harvest objective of 50 bears/year. Mean 3–year annual hunter harvest was 26 bears/year. A 3–year mean of 7 bears/year were taken with bait, a decrease from 10 bears/year during the previous 3–year period (Table 1).

Most bears killed were males and comprised 56–60% of the annual harvest (Table 1). MacHutchon and Smith (1988), as reported by Hechtel (1991), suggested a harvest in excess of 35% females could warrant detailed harvest assessment to determine excessive harvest.

Nonhunting Mortality. In RY99 and RY00, 1 bear was killed each year in defense of life or property, and 1 bear was killed on the road in RY00 (Table 1).

Harvest Locations. The Unit 20D harvest objective not to exceed 15 bears/year south of the Tanana River has only been exceeded twice since RY87; once in RY97 with a harvest of 22 and once in RY98 with a harvest of 16 bears (Table 2). From RY87 to RY00 the southern Unit 20D harvest goal was exceeded in RY97.

The 10-year mean annual harvest for this portion of the unit was 12.9, so it is unlikely that exceeding the harvest objective during these 2 years has affected the status of the black bear population.

Reported harvest south of the Tanana River averaged 14 bears/year during the last 3 years. This take represented an estimated annual harvest of 6.2% of the estimated adult population south of the Tanana River.

The reported harvest north of the Tanana averaged 10 bears/year during the last 3 years. This harvest represented an annual estimated take of 1.9% of the estimated adult population north of the Tanana River.

Hunter Residency. Most black bears were taken by local residents (Table 3). Black bear harvest by nonlocal residents increased from RY93 to RY97, but declined during this reporting period, ranging from a low of 9% in RY00 to a high of 26% in RY99. Few nonresidents killed black bears in Unit 20D.

Harvest Chronology. Most bears continued to be harvested in May–June and August–September (Table 4).

Transportation Methods. The most popular modes of transportation for black bear hunters in Unit 20D continued to be 3- or 4-wheelers and highway vehicles (Table 5). Other commonly used modes of transportation include airplanes, boats, and walking.

CONCLUSIONS AND RECOMMENDATIONS

We monitored harvest of black bears to assure that hunting did not have negative effects on the population. Liberal seasons and bag limits provided hunters maximum opportunity to hunt black bears in Unit 20D. Harvest levels generally met management objectives. However, harvest exceeded the management objective of 15 black bears south of the Tanana River during RY98 and the 3–year mean harvest of 14 bears/year is near the maximum harvest objective. Because most bears harvested were males, no changes in regulations are recommended at this time; however, harvest rates should be monitored closely in the future to determine if harvest increases and if the proportion of females in the harvest becomes excessive.

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Table 1 Unit 20D black bear harvest, regulatory years 1987–1988 through 2000–2001

Regulatory year	Reported												Estimated kill		Total reported and estimated kill							
	Hunter kill								Nonhunting kill[a]													
	M (%)		F (%)		Unk		Total	Baited	M	F	Unk		Unrep	Illegal	M (%)		F (%)		Unk(%)		Total	
1987–1988																						
Fall 1987	5	(50)	5	(50)	0	(0)	10	--	0	0	0		0	0	5	(50)	5	(50)	0	(0)	10	
Spring 1988	6	(86)	1	(14)	0	(0)	7	--	0	0	0		0	0	6	(86)	1	(14)	0	(0)	7	
Total	11	(65)	6	(35)	0	(0)	17	--	0	0	0		0	0	11	(65)	6	(35)	0	(0)	17	
1988–1989																						
Fall 1988	4	(57)	3	(43)	0	(0)	7	--	0	0	0		0	0	4	(57)	3	(43)	0	(0)	7	
Spring 1989	5	(71)	2	(29)	0	(0)	7	--	0	0	0		0	0	5	(71)	2	(29)	0	(0)	7	
Total	9	(64)	5	(36)	0	(0)	14	--	0	0	0		0	0	9	(64)	5	(36)	0	(0)	14	
1989–1990																						
Fall 1989	6	(75)	2	(25)	0	(0)	8	--	0	0	0		0	0	6	(75)	2	(25)	0	(0)	8	
Spring 1990	8	(89)	1	(11)	0	(0)	9	--	0	0	3		0	0	8	(89)	1	(11)	3	(25)	12	
Total	14	(82)	3	(18)	0	(0)	17	--	0	0	3		0	0	14	(82)	3	(18)	3	(15)	20	
1990–1991																						
Fall 1990	2	(100)	0	(0)	0	(0)	2	--	0	0	1		0	0	2	(100)	0	(0)	1	(33)	3	
Spring 1991	5	(71)	2	(29)	0	(0)	7	--	0	0	0		0	0	5	(71)	2	(29)	0	(0)	7	
Total	7	(78)	2	(22)	0	(0)	9	--	0	0	1		0	0	7	(78)	2	(22)	1	(10)	10	
1991–1992																						
Fall 1991	6	(100)	0	(0)	0	(0)	6	--	0	0	0		0	0	6	(100)	0	(0)	0	(0)	6	
Spring 1992	3	(100)	0	(0)	0	(0)	3	--	0	0	0		0	0	3	(100)	0	(0)	0	(0)	3	
Total	9	(100)	0	(0)	0	(0)	9	--	0	0	0		0	0	9	(100)	0	(0)	0	(0)	9	
1992–1993																						
Fall 1992	4	(57)	2	(29)	1	(14)	7	0	0	0	0		0	0	4	(57)	2	(29)	1	(14)	7	
Spring 1993	9	(75)	3	(25)	0	(0)	12	7	0	0	1		0	0	9	(69)	3	(23)	1	(8)	13	
Total	13	(68)	5	(26)	1	(5)	19	7	0	0	1		0	0	13	(65)	5	(25)	2	(10)	20	
1993–1994																						
Fall 1993	6	(55)	4	(36)	1	(9)	11	0	0	0	0		0	0	6	(55)	4	(36)	1	(9)	11	
Spring 1994	6	(43)	8	(57)	0	(0)	14	8	0	0	0		0	0	6	(43)	8	(57)	0	(0)	14	
Total	12	(48)	12	(48)	1	(4)	25	8	0	0	0		0	0	12	(48)	12	(48)	1	(4)	25	
1994–1995																						
Fall 1994	3	(100)	0	(0)	0	(0)	3	0	0	0	0		0	0	3	(100)	0	(0)	0	(0)	3	
Spring 1995	6	(55)	5	(46)	0	(0)	11	6	0	0	0		0	0	6	(55)	5	(46)	0	(0)	11	
Total	9	(64)	5	(36)	0	(0)	14	6	0	0	0		0	0	9	(64)	5	(36)	0	(0)	14	
1995–1996																						
Fall 1995	3	(75)	1	(25)	0	(0)	4	0	0	0	0		0	0	3	(75)	1	(25)	0	(0)	4	
Spring 1996	10	(67)	5	(33)	0	(0)	15	7	1	0	0		0	0	11	(69)	5	(31)	0	(0)	16	
Total	13	(68)	6	(32)	0	(0)	19	7	1	0	0		0	0	14	(70)	6	(30)	0	(0)	20	
1996–1997																						

Regulatory year	Reported												Total reported and estimated kill									
	Hunter kill							Nonhunting kill[a]			Estimated kill											
	M (%)		F (%)		Unk		Total	Baited	M	F	Unk	Unrep	Illegal	M (%)		F (%)		Unk(%)		Total
Fall 1996	9	(82)	2	(18)	0	(0)	11	0	0	0	0	0	0	9	(82)	2	(18)	0	(0)	11
Spring 1997	6	(50)	6	(50)	0	(0)	12	8	0	0	0	0	0	6	(50)	6	(50)	0	(0)	12
Total	15	(65)	8	(35)	0	(0)	23	8	0	0	0	0	0	15	(65)	8	(35)	0	(0)	23
1997–1998																						
Fall 1997	8	(73)	3	(27)	0	(0)	11	0	1	0	0	0	0	9	(75)	3	(25)	0	(0)	12
Spring 1998	17	(90)	1	(5)	1	(5)	19	15	1	0	0	0	0	18	(90)	1	(5)	1	(5)	20
Total	25	(87)	4	(13)	1	(3)	30	15	2	0	0	0	0	27	(84)	4	(13)	1	(3)	32
1998–1999																						
Fall 1998	7	(70)	3	(30)	0	(0)	10	0	0	0	0	0	0	7	(70)	3	(30)	0	(0)	10
Spring 1999	6	(50)	6	(50)	0	(0)	12	7	0	0	0	0	0	6	(50)	6	(50)	0	(0)	12
Total	13	(59)	9	(41)	0	(0)	22	7	0	0	0	0	0	13	(59)	9	(41)	0	(0)	22
1999–2000																						
Fall 1999	6	(55)	4	(36)	1	(9)	11	0	0	0	1	0	0	6	(50)	4	(33)	2	(17)	12
Spring 2000	4	(57)	3	(43)	0	(0)	7	4	0	0	0	0	0	4	(57)	3	(43)	0	(0)	7
Total	10	(56)	7	(39)	1	(6)	18	4	0	0	1	0	0	10	(53)	7	(37)	2	(11)	19
2000–2001																						
Fall 2000	14	(64)	8	(36)	0	(0)	22	0	1	1	0	0	0	15	(63)	9	(38)	0	(0)	24
Spring 2001	8	(53)	7	(47)	0	(0)	15	11	0	0	0	0	0	8	(53)	7	(47)	0	(0)	15
Total	22	(60)	15	(41)	0	(0)	37	11	1	1	0	0	0	23	(59)	16	(41)	0	(0)	39

[a] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Unit 20D black bear harvest location, regulatory years 1987–1988 through 2000–2001

Regulatory year	South of Tanana River		North of Tanana River				
	n	(%)	*n*	(%)	Unk	(%)	*n*
1987–1988	14	(82)	3	(18)			17
1988–1989	9	(64)	5	(36)			14
1989–1990	10	(59)	7	(41)			17
1990–1991	4	(45)	5	(56)			9
1991–1992	7	(78)	2	(22)			9
1992–1993	10	(50)	10	(50)			20
1993–1994	13	(52)	12	(48)			25
1994–1995	10	(71)	4	(29)			14
1995–1996	13	(68)	6	(32)			19
1996–1997	12	(52)	11	(48)			23
1997–1998	22	(73)	8	(27)			30
1998–1999	16	(73)	6	(27)			22
1999–2000	11	(58)	7	(37)	1	(5)	19
2000–2001	15	(47)	16	(50)	1	(3)	32

Table 3 Unit 20D black bear successful hunter residency, regulatory years 1987–1988 through 2000–2001

Regulatory year	Local[a] resident (%)	Nonlocal resident (%)	Nonresident (%)	Unk (%)	Total successful hunters
1987–1988	13 (76)	3 (18)	1 (6)		17
1988–1989	8 (57)	4 (29)	2 (14)		14
1989–1990	10 (59)	6 (35)	1 (6)		17
1990–1991	6 (67)	1 (11)	2 (22)		9
1991–1992	8 (89)	1 (11)	0 (0)		9
1992–1993	13 (68)	3 (16)	3 (16)		19
1993–1994	8 (32)	13 (52)	4 (16)		25
1994–1995	7 (50)	7 (50)	0 (0)		14
1995–1996	9 (47)	10 (53)	0 (0)		19
1996–1997	12 (52)	10 (44)	1 (4)		23
1997–1998	18 (60)	12 (40)	0 (0)		30
1998–1999	19 (86)	3 (14)	0 (0)		22
1999–2000	12 (63)	5 (26)	1 (5)	1 (5)	19
2000–2001	26 (81)	3 (9)	3 (9)		32

[a] Local residents are residents of Unit 20D.

Table 4 Unit 20D black bear harvest chronology percent by month, regulatory years 1987–1988 through 2000–2001

Regulatory	Harvest chronology percent by month								
year	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
1987–1988	12	18	29	0	0	6	24	12	17
1988–1989	7	14	29	0	0	0	21	29	14
1989–1990	0	18	29	0	0	0	41	12	17
1990–1991	0	22	0	0	0	0	33	44	9
1991–1992	33	0	0	0	0	0	33	33	9
1992–1993	5	5	26	0	0	0	32	32	19
1993–1994	0	12	32	0	0	0	32	24	25
1994–1995	7	14	0	0	0	0	43	36	14
1995–1996	11	11	11	0	0	0	32	37	19
1996–1997	17	17	13	0	0	0	30	22	23
1997–1998	3	17	17	0	0	0	43	20	30
1998–1999	5	14	27	0	0	0	27	27	22
1999–2000	17	22	22	6	0	0	11	28	18
2000–2001	3	9	41	0	0	0	9	38	32

Table 5 Unit 20D black bear harvest percent by transport method, regulatory years 1987–1988 through 2000–2001

Regulatory year	Harvest percent by transport method										
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walk	Other	Unk	*n*
1987–1988	6	0	0	0	0	24	24	29		18	17
1988–1989	21	0	29	7	0	7	14	7		14	14
1989–1990	0	6	12	0	0	47	18	0		18	17
1990–1991	0	0	11	22	0	33	22	0		11	9
1991–1992	0	0	11	22	11	0	33	22		0	9
1992–1993	5	0	21	26	0	11	21	11	5	0	19
1993–1994	8	0	24	44	0	0	4	16	4	0	25
1994–1995	0	0	14	29	0	0	29	29	0	0	14
1995–1996	16	0	5	47	0	0	16	11	5	0	19
1996–1997	9	0	26	30	0	4	17	13	0	0	23
1997–1998	10	0	10	30	0	0	47	3	0	0	30
1998–1999	14	0	9	36	0	5	23	10	5	0	22
1999–2000	16	0	21	32	0	0	16	5	11	0	19
2000–2001	6	3	31	25	0	3	16	16	0	0	32

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 1998
To: 30 June 2001

LOCATION

GAME MANAGEMENT UNIT: 20E (10,681 mi^2)

GEOGRAPHIC DESCRIPTION: Fortymile, Charley, and Ladue River drainages, including the Tanana Uplands and all drainages into the south bank of the Yukon River upstream from and including the Charley River drainage

BACKGROUND

Black bears live throughout forested habitat in Unit 20E. Observations by long-term area residents indicate that black bear numbers fluctuated during the past 40 years in relation to grizzly bear population trends. Black bear numbers were thought to be highest following federal predator control poisoning efforts of the 1950s that caused grizzly bear numbers to decline and remain depressed during the 1960s and early 1970s. As grizzly bear numbers recovered during the 1970s through the mid-1980s, black bear numbers appeared to decline. Grizzly bears are known to kill black bears but how important that mortality is to black bear population trend in Unit 20E is not known. Black bear abundance may also have declined due to poor habitat quality. Until the 1990s, fire suppression activities in Unit 20E allowed extensive areas of black spruce stands to reach climax stage, a stage that does not produce high-quality black bear food.

During the 1990s the black bear population in Unit 20E appeared stable. The highest densities occurred in hardwood habitats near the community of Chicken and along the Yukon River. Historically, interest in black bear hunting in the subunit has been low.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect, maintain, and enhance the black bear population and its habitat in concert with other components of the ecosystem.

- Provide the greatest sustained opportunity to participate in hunting black bears.

MANAGEMENT OBJECTIVES

- Manage for a harvest of black bears that maintains 55% or more males in the combined harvests of the most recent 3 years.

METHODS

Annual harvest information was collected from hunters during the mandatory sealing process of hunter-killed bears and bears killed in defense of life or property (DLP). Information collected included harvest date and location, sex of the bear, skull size, transportation mode, number of days hunted, salvage of meat, and bait use. A premolar tooth was extracted from most bears brought in for sealing; however, black bear teeth have not been sectioned for aging for several years. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY00 = 1 Jul 2000–30 Jun 2001).

In summer 2000 we established 3 permanent blueberry sample areas in Unit 20E and 5 in adjacent Unit 12 to assess annual berry abundance. Each area has 5 1-m^2 plots. Sample areas and individual plots were not selected randomly but by the presence of blueberry plants. We selected for a variety of habitat types, aspects, elevations, and slopes. We placed a rain gauge at each site. Each year we will monitor rainfall and temperatures to determine the effects on blossom and berry production. To measure berry production, we will count the number of berries within each plot at the same time each year. Over time we hope to compare berry production between years and sites and evaluate the effects of berry abundance on bear harvest and the number of problem bear incidents.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

We did not conduct population surveys during the report period to determine black bear population size and trend. I estimated the Unit 20E black bear population was 1000–1500 bears. My estimate is based on population data collected in adjacent Unit 12 (Kelleyhouse 1990) during the early 1980s and in Unit 20A (Hechtel 1991). The composition of the Unit 20E population is unknown. A prescribed burn set by the Alaska Department of Fish and Game (ADF&G) in July 1999 within the Kechumstuk drainage and a wildfire along the north fork of the Fortymile River west of Chicken during 2000 probably displaced some black bears, but the effect on population trend is not known.

Distribution and Movements

Black bears inhabited all of the forested habitats within Unit 20E. Their movement patterns within the subunit are unknown.

MORTALITY

Harvest

Season and Bag Limit. There was no closed season for black bears in Unit 20E, and the bag limit was 3 bears. Harvest of cubs (first year of life) and females accompanied by cubs was prohibited.

Alaska Board of Game Actions and Emergency Orders. In January 2000 the Alaska Board of Game adopted a regulation requiring hunters who used bait stations registered by another hunter to obtain written permission from that hunter and to place their own hunting license number at the site. In January 1998 the board adopted a regulation allowing the sale of handcrafted items made from black bear fur. In January 1996 the board passed a regulation requiring the salvage of meat, hides, and skulls from black bears harvested during 1 January–31 May in units requiring sealing, which included Unit 20E.

Hunter Harvest. During RY98–RY00 the annual reported harvest was 11–15 black bears ($\bar{x}$ = 13 bears) in Unit 20E (Table 1). The previous 5-year average harvest was 16 bears. The historically low harvest (0.5–2% harvest rate) was due to low hunter interest. During RY98–RY00, 2 hunters each year were responsible for 13–36% of the annual harvest compared to the 5 previous years when multiple harvest by individual hunters accounted for 0–38% ($\bar{x}$ = 13.4%; 3 years had 0 hunters taking multiple bears).

Prior to RY98, few hunters hunted specifically for black bear during the fall and incidental take accounted for 50–85% of the fall harvest. During RY98–RY00 the number of fall hunters remained low but 60% of the successful hunters stated they specifically hunted black bears. Historically, few hunters hunt over bait in the spring. Between RY90 and RY00, only 10 of 70 (14.3%) black bears harvested during the spring in Unit 20E were killed at bait stations, compared to 157 of 264 (59.5%) black bears in adjacent Unit 12. All registered bait stations were in the Eagle area.

During RY98–RY00 the average skull size of males was 17.2 inches (n = 32). The previous 5-year average was 16.4 inches. The combined percent males in the harvest was 80% compared to 70% the previous 5 years. Consistent skull sizes and high percentage of males in the harvest indicated human-induced mortality had minimal effects on this population. These 2 parameters will be monitored closely to detect any changes in the black bear population.

Circumstantial evidence indicates berry abundance may affect bear harvest. During years of poor berry production, bears may travel more in search of berries and/or may be more attracted to hunter-killed moose or caribou or other human foods. These behaviors would increase the vulnerability of bears to hunters.

In an attempt to better evaluate bear harvest in relation to berries, we established 3 blueberry sample areas in Unit 20E and 5 in adjacent Unit 12 during July 2000 (Table 2). Two years of data are presented in Table 3. These data and discussions with local berry pickers, hunters, and hikers, indicate blueberries were locally abundant in 2000 but were sparse overall. Blueberries were more abundant in all habitats in 2001. We will monitor berry abundance, berry quality in terms of sugar content, and total rainfall within these plots annually to determine if there is a correlation between berry abundance and quality and bear harvest.

Hunter Residency and Success. During RY98–RY00 Alaska residents harvested 97% of the black bears taken in Unit 20E (Table 4). Of these, Unit 20E residents took 35% of the harvest and the 5-year average was 38%. During RY90–RY94 local residents took 62% of the harvest. Average annual harvest did not decline during RY95–RY00 because local residents took fewer black bears. Instead, the timing of the harvest changed as more nonlocal Alaska residents took black bears in Unit 20E during the fall. Prior to RY95 most (56%) of the Unit 20E black bear harvest occurred during spring. During spring few nonlocal residents travel to Unit 20E to hunt black bears, and during most years unit residents took over 80% of the spring harvest.

One black bear was taken by a nonresident during RY98–RY00. Since RY90 nonresidents have taken 9 black bears (6% of the harvest).

No measure of hunter success was available because unsuccessful hunters were not required to report. During RY98–RY00 successful hunters spent 3.8–7.8 days afield ($\bar{x}$ = 6.3 days). The previous 5-year average was 3.8 days. The greatest increase in hunter effort was during the fall seasons, which coincided with more hunters who specifically hunted black bears and did not take them incidentally to hunting other species.

Harvest Chronology. During RY98–RY00, 50–87% ($\bar{x}$ = 65%) of the black bear harvest was taken during fall (Table 5). Since RY95 most harvest has occurred during the fall season (65%). Black bear harvest in July was primarily bears that wandered into fish camps or into people's yards.

Transport Methods. During RY98–RY00, 4-wheelers (31%), highway vehicles (30%), and boats (26%) were the most common modes of transportation for successful black bear hunters (Table 6). The use of 4-wheelers for hunting black bears increased since 1993 and comparable to transportation data for moose and caribou hunters, surpassed highway vehicles as the primary mode of transportation in Unit 20E.

HABITAT

Assessment

Black bear habitat is extensive in Unit 20E. Only treeless habitat, generally above elevations of 4000 feet, is not black bear habitat. Blueberries, crowberries, and cranberries are widely available, and bearberries are available in a few areas. Human-caused changes in the quantity and quality of black bear habitat are not expected because little development has occurred or is planned within black bear habitat in Unit 20E.

Enhancement

The implementation of the Alaska Interagency Fire Management Plan allowed wildfires to burn in more areas than before 1984. Also, 3 prescribed burns were ignited during 1997–1999, affecting about 95,000 acres of black bear habitat. Revegetation of preferred plant species in burned-over areas is expected to provide better forage for black bears than is available in mature forests of black or white spruce.

CONCLUSIONS AND RECOMMENDATIONS

We met all management goals and objectives during RY98–RY00. Black bears in Unit 20E were lightly harvested and were hunted primarily during the fall by nonlocal Alaska residents. Highway vehicles and 4-wheelers were used by 61% of the successful hunters. At the estimated harvest rate, harvest was likely to have little effect on the status and trend of the population. Males composed 80% of the harvest during the past 3 years and skull size remained relatively constant. I recommend no changes in seasons or bag limits or in management goals and objectives.

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Table 1 Unit 20E black bear harvest, regulatory years 1990–1991 through 2000–2001

Regulatory year	Reported								Estimated kill		Total reported and estimated kill			
	Hunter kill					Nonhunting kill[a]								
	M	F	Unk	Total	Baited	M	F	Unk	Unreported	Illegal	M (%)	F (%)	Unk	Total
1990–1991														
Fall 1990	2	4	0	6	0	0	0	0	0	0	2 (33)	4 (67)	0 (0)	6
Spring 1991	3	2	0	5	0	0	0	0	0	0	3 (60)	2 (40)	0 (0)	5
Total	5	6	0	11	0	0	0	0	0	0	5 (45)	6 (55)	0 (0)	11
1991–1992														
Fall 1991	2	1	0	3	0	1	0	0	0	0	3 (75)	1 (25)	0 (0)	4
Spring 1992	5	0	0	5	0	0	0	0	0	0	5 (100)	0 (0)	0 (0)	5
Total	7	1	0	8	0	1	0	0	0	0	8 (89)	1 (11)	0 (0)	9
1992–1993														
Fall 1992	6	2	0	8	0	0	0	0	0	0	6 (75)	2 (25)	0 (0)	8
Spring 1993	9	3	0	12	1	0	0	0	0	0	9 (75)	3 (25)		12
Total	15	5	0	20	1	0	0	0	0	0	15 (75)	5 (25)	0 (0)	20
1993–1994														
Fall 1993	4	2	0	6	0	0	0	0	0	0	4 (67)	2 (33)	0 (0)	6
Spring 1994	4	1	0	5	0	0	0	0	0	0	4 (80)	1 (20)	0 (0)	5
Total	8	3	0	11	0	0	0	0	0	0	8 (73)	3 (27)	0 (0)	11
1994–1995														
Fall 1994	6	1	0	7	0	0	0	0	0	0	6 (86)	1 (14)	0 (0)	7
Spring 1995	9	2	0	11	2	0	0	0	0	0	9 (82)	2 (18)	0 (0)	11
Total	15	3	0	18	2	0	0	0	0	0	15 (83)	3 (17)	0 (0)	18
1995–1996														
Fall 1995	11	3	0	14	0	0	0	0	0	0	11 (79)	3 (21)	0 (0)	14
Spring 1996	5	4	0	9	1	0	0	0	0	0	5 (56)	4 (44)	0 (0)	9
Total	16	7	0	23	1	0	0	0	0	0	16 (70)	7 (30)	0 (0)	23
1996–1997														
Fall 1996	8	7	0	15	0	0	0	0	0	0	8 (53)	7 (47)	0 (0)	15
Spring 1997	2	4	0	6	4	0	0	0	0	0	2 (33)	4 (67)	0 (0)	6
Total	10	11	0	21	4	0	0	0	0	0	10 (48)	11 (52)	0 (0)	21
1997–1998														
Fall 1997	4	0	0	4	0	0	0	0	0	0	4 (100)	0 (0)	0 (0)	4
Spring 1998	3	0	0	3	0	0	0	0	0	0	3 (100)	0 (0)	0 (0)	3
Total	7	0	0	7	0	0	0	0	0	0	7 (100)	0 (0)	0 (0)	7

Regulatory year	Reported								Estimated kill		Total reported and estimated kill			
	Hunter kill					Nonhunting kill[a]								
	M	F	Unk	Total	Baited	M	F	Unk	Unreported	Illegal	M (%)	F (%)	Unk	Total
1998–1999														
Fall 1998	9	4	0	13	0	0	0	0	0	0	9 (69)	4 (31)	0 (0)	13
Spring 1999	2	0	0	2	0	0	0	0	0	0	2 (100)	0 (0)	0 (0)	2
Total	11	4	0	15	0	0	0	0	0	0	11 (73)	4 (27)	0 (0)	15
1999–2000														
Fall 1999	4	2	0	6	0	0	0	0	0	0	4 (67)	2 (33)	0 (0)	6
Spring 2000	4	1	0	5	0	0	0	0	0	0	4 (80)	1 (20)	0 (0)	5
Total	8	3	0	11	0	0	0	0	0	0	8 (73)	3 (27)	0 (0)	11
2000–2001														
Fall 2000	6	1	0	7	0	0	0	0	0	0	6 (86)	1 (14)	0 (0)	7
Spring 2001	7	0	0	7	2	0	0	0	0	0	7 (100)	0 (0)	0 (0)	7
Total	13	1	0	14	2	0	0	0	0	0	13 (93)	1 (7)	0 (0)	14

[a] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Blueberry sample areas in Units 20E and 12

Area	Unit	Elevation	Aspect	Slope	Primary vegetation
Clearwater	12	1966	Flat	Flat	spruce/muskeg
7-Mile	12	1859	Flat	Flat	spruce/willow
Pipeline	12	1888	5–10[a]	SSW	spruce/willow
RCA	12	2197	15–20[a]	N	spruce/alder
4-Mile	12	2300	5–10[a]	S	spruce/tussock
9-Mile	20E	2722	5–10[a]	NE	1990 burn/willow
Ptarmigan	20E	3643	10–15[a]	W	willow/alder
Fairplay	20E	3640	10[a]	SW	willow

Table 3 Blueberry production in 8 sample units in Units 12 and 20E, 2000–2001

Calendar year	Sample units[a]								Bear harvest[b]	DLP[b,c]
	Clearwater	7-Mile	Pipeline	RCA	4-Mile	9-Mile	Fairplay Ptarmigan	Fairplay 2		
2000	137 (33.6)	3 (0.89)	19 (5.76)	7 (1.95)	55 (2.55)	51 (6.30)	124 (24.31)	46 (9.42)	15	2
2001	285 (64.36)	23 (4.34)	278 (55.86)	23 (3.13)	356 (36.09)	400 (26.24)	379 (79.05)	599 (109.69)	11	0

[a] Numbers in parentheses is the variance among plots within a study area.
[b] Unit 20E only.
[c] Number of bears killed in defense of life and property (DLP) also includes bears harvested in July.

Table 4 Unit 20E successful black bear hunter residency, regulatory years 1990–1991 through 2000–2001

Regulatory year	Unit resident (%)	Other residents (%)	Nonresident (%)	Total successful hunters
1990–1991	7 (64)	4 (36)	0 (0)	11
1991–1992	6 (75)	2 (25)	0 (0)	8
1992–1993	9 (45)	8 (40)	3 (15)	20
1993–1994	6 (55)	4 (36)	1 (9)	11
1994–1995	13 (72)	5 (28)	0 (0)	18
1995–1996	7 (30)	13 (57)	3 (13)	23
1996–1997	7 (41)	9 (53)	1 (6)	21
1997–1998	3 (43)	4 (57)	0 (0)	7
1998–1999	3 (20)	11 (73)	1 (7)	15
1999–2000	5 (45)	6 (55)	0 (0)	11
2000–2001	6 (43)	8 (57)	0 (0)	14

Table 5 Unit 20E black bear harvest chronology percent by month, regulatory years 1990–1991 through 2000–2001

Regulatory year	Harvest chronology percent by month								
	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
1990–1991	0	36	18	0	0	0	27	18	11
1991–1992	13	13	13	0	0	0	13	50	8
1992–1993	5	30	5	0	0	0	30	30	20
1993–1994	9	36	0	9	0	0	36	9	11
1994–1995	12	12	18	0	0	0	41	18	18
1995–1996	0	39	22	0	0	0	39	0	23
1996–1997	14	29	29	0	0	0	10	19	21
1997–1998	0	14	43	0	0	0	29	14	7
1998–1999	0	67	20	0	0	0	7	7	15
1999–2000	0	0	55	0	0	0	18	27	11
2000–2001	14	0	36	0	0	0	43	7	14

Table 6 Unit 20E black bear harvest percent by transport method, regulatory years 1990–1991 through 2000–2001

Regulatory year	Harvest percent by transport method (%)									*n*
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walking	Unknown	
1990–1991	0 (0)	0 (0)	2 (18)	1 (9)	0 (0)	0 (0)	7 (64)	1 (9)	0 (0)	11
1991–1992	2 (25)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (63)	0 (0)	1 (13)	8
1992–1993	2 (10)	0 (0)	4 (20)	0 (0)	0 (0)	0 (0)	12 (60)	1 (5)	1 (5)	20
1993–1994	0 (0)	0 (0)	2 (18)	4 (36)	0 (0)	0 (0)	2 (18)	2 (18)	1 (9)	11
1994–1995	0 (0)	0 (0)	3 (17)	5 (28)	0 (0)	0 (0)	10 (56)	0 (0)	0 (0)	18
1995–1996	1 (4)	0 (0)	7 (30)	2 (9)	0 (0)	0 (0)	10 (43)	2 (9)	1 (4)	23
1996–1997	1 (5)	0 (0)	4 (19)	6 (29)	0 (0)	2 (9)	7 (33)	1 (5)	0 (0)	21
1997–1998	0 (0)	0 (0)	3 (43)	1 (14)	0 (0)	0 (0)	1 (14)	2 (29)	0 (0)	7
1998–1999	0 (0)	0 (0)	2 (13)	5 (33)	0 (0)	0 (0)	5 (33)	3 (20)	0 (0)	15
1999–2000	0 (0)	0 (0)	5 (45)	2 (18)	0 (0)	0 (0)	3 (27)	1 (9)	0 (0)	11
2000–2001	0 (0)	0 (0)	3 (21)	6 (43)	0 (0)	0 (0)	4 (29)	1 (7)	0 (0)	14